Summary of Last Lecture

Functional Dependency :

- Direct
- Indirect (logically derived)

  Reflexivity, Augmentation ,Transitivity ,

  Additivity, Projectivity , Pseudotransitivity

Functional dependency closure (F+)

Closure of Functional Dependency

The set of functional dependencies and all logically implied functional dependencies form a closure of F.

Denoted by F+

Eg – R=(A,B,C,D) and F = {A →B, A→C, BC→D}

F |= { A → BC , A → D}

F+ = { A →B, A→C, BC→D , A → BC , A → D }

Closure of Functional Dependency

Eg. R = (A,B,C,D,E) and F={A -> BC, CD -> E, B ->D,
E -> A }

FIND F+?

Eg. R = (A,B,C) and F ={ A -> B, B -> C }

FIND F+?

Closure of Attribute Set

It is a set of all attributes that are dependent on X and derived using the FDs in F.

Denoted by X+

Algorithm to compute X+

X+ = X (where X is candidate key)

while (changes to X+) do

for each FD w → z in F do

begin

if w ⊆ X+ then

X+ = X+ ∪ z

end

Closure of Attribute Set

Eg. Compute X+ of X = BCD for R = (ABCDEH)

F = {A->BC, CD->E, E->C, D->AEH, ABH->BD, DH->BC}

Algorithm to compute X+

X+ = X (where X is candidate key)

while (changes to X+) do

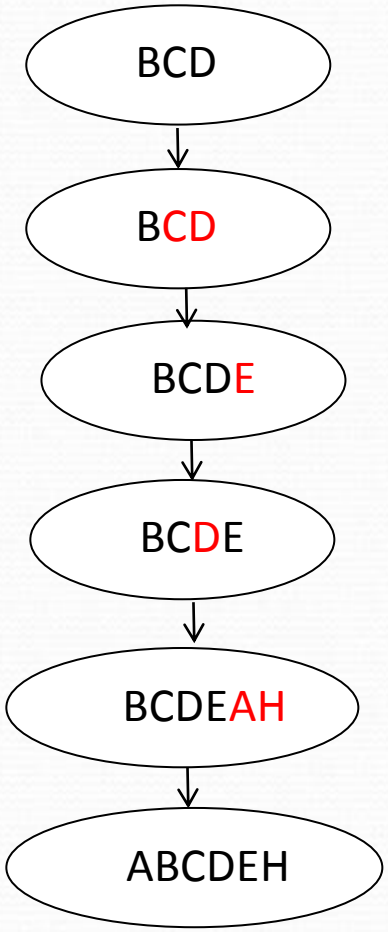
for each FD w → z in F do

begin

if w ⊆ X+ then

X+ = X+ ∪ z

end



Closure of Attribute Set

Eg. R = (ABCDE) and F ={AB->E, AD->B, B->C, C->D}

Find X+ if X = AC

Ans : AC is a candidate key

Eg. R =(ABCDEH) and F={A->BC, CD->E, E->C, AH->D}

Find candidate key and compute X+

Ans : AH is a candidate key

Eg. R = (ABCDE) and F={A->B, BC->E, ED->A}

Find candidate key and compute X+

Ans : ACD , BCD , CDE are candidate key

Closure of Attribute Set

Eg. R=(ABCDE) and F={A->BC, CD->E, B->D, E->A}

Find candidate key and compute X+

Ans : A, E, CD are candidate keys

Eg. R = (ABCDEH) and F={A->BC, CD->E, E->C,
D->AEH, ABH->BD, DH->BC}

Find candidate key and computer X+

Ans : CD, D, ABH, DH, AH are candidate keys